

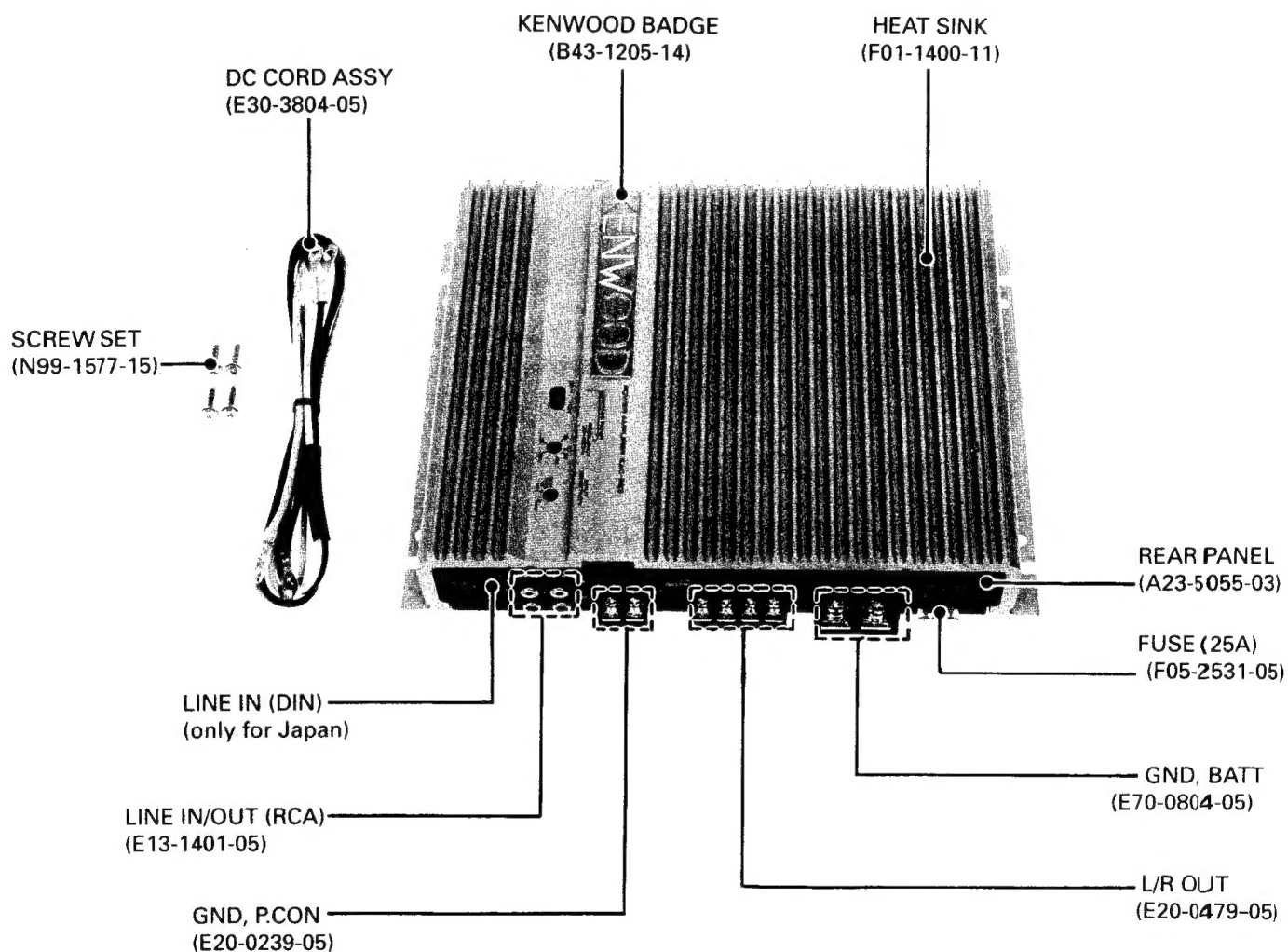
CAR STEREO AMPLIFIER

# KAC-823

## SERVICE MANUAL

# KENWOOD

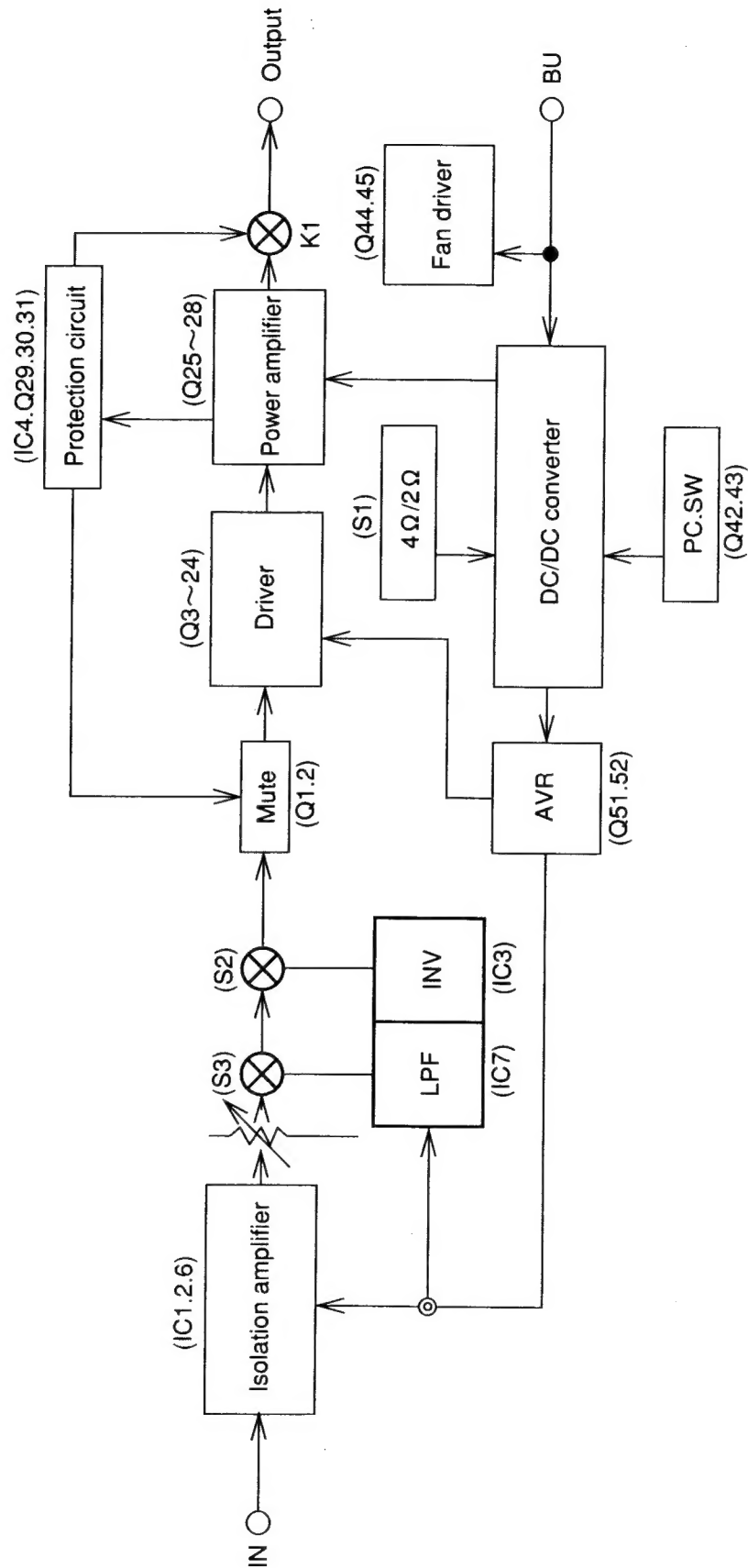
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## BLOCK DIAGRAM



## CIRCUIT DESCRIPTION

### Indicator lighting condition

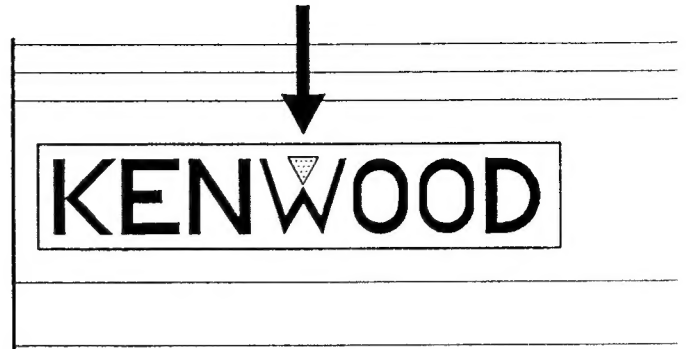
The PWR indicator lights green and red

[Green]

- (1) After P. CON turns on until the relay operates
- (2) If an error occurs and protection works

[Red]

During normal operation



## CIRCUIT DESCRIPTION

FUNCTIONS OF COMPONENTS  
(X09-3640-10)

Components	Application/functions	Operation/conditions/compatibility
IC 1,2,6	Isolation amplifier	Removes car noise that enters the amplifier.
IC 3	Inverter circuit	Bridging inverter
IC 4	Protection	Overload, DC offset, and P. con detection
IC 5	Switching regulator	DC/DC converter oscillator (Pulse Width Modulation control for (X09-3640-10) destination)
IC 7	LPF	LPF for sub-woofer
Q 1,2	Input mute	Operates before the relay operates when the amplifier is turned on or off to protect the relay contact.
Q 3~6	Input differential amplifier	Apply input to the one end and negative feedback to the other to determine the amplifier gain.
Q 7~10	Differential amplifier, second stage	
Q 11~14	Differential amplifier, third stage	
Q 15~16	Thermal protection	Prevents temperature rise.
Q 17~18	Current mirror	Load on differential amplifier Q13 and Q14 at the third stage
Q 19,20	Temperature compensation	
Q 21~24	Power drive stage	
Q 25~28	Power stage	
Q 29~30	Current detection	Detects overcurrent and controls IC4.
Q 32~37	Switching power stage	
Q 38~41,48,49	Switching driver	
Q 42,43	Power switch	When Q43 turns on, Q42 turns on to supply power.
Q 44,45	Fan drive	Detects temperature with TH3 and operates the fan.
Q 46,47	Operation indicator driver	Q46 turns on when the amplifier is protected. Q47 turns on when the amplifier is operating.
Q 51,52	AVR	$\pm 20$ V, constant voltage

## ADJUSTMENT

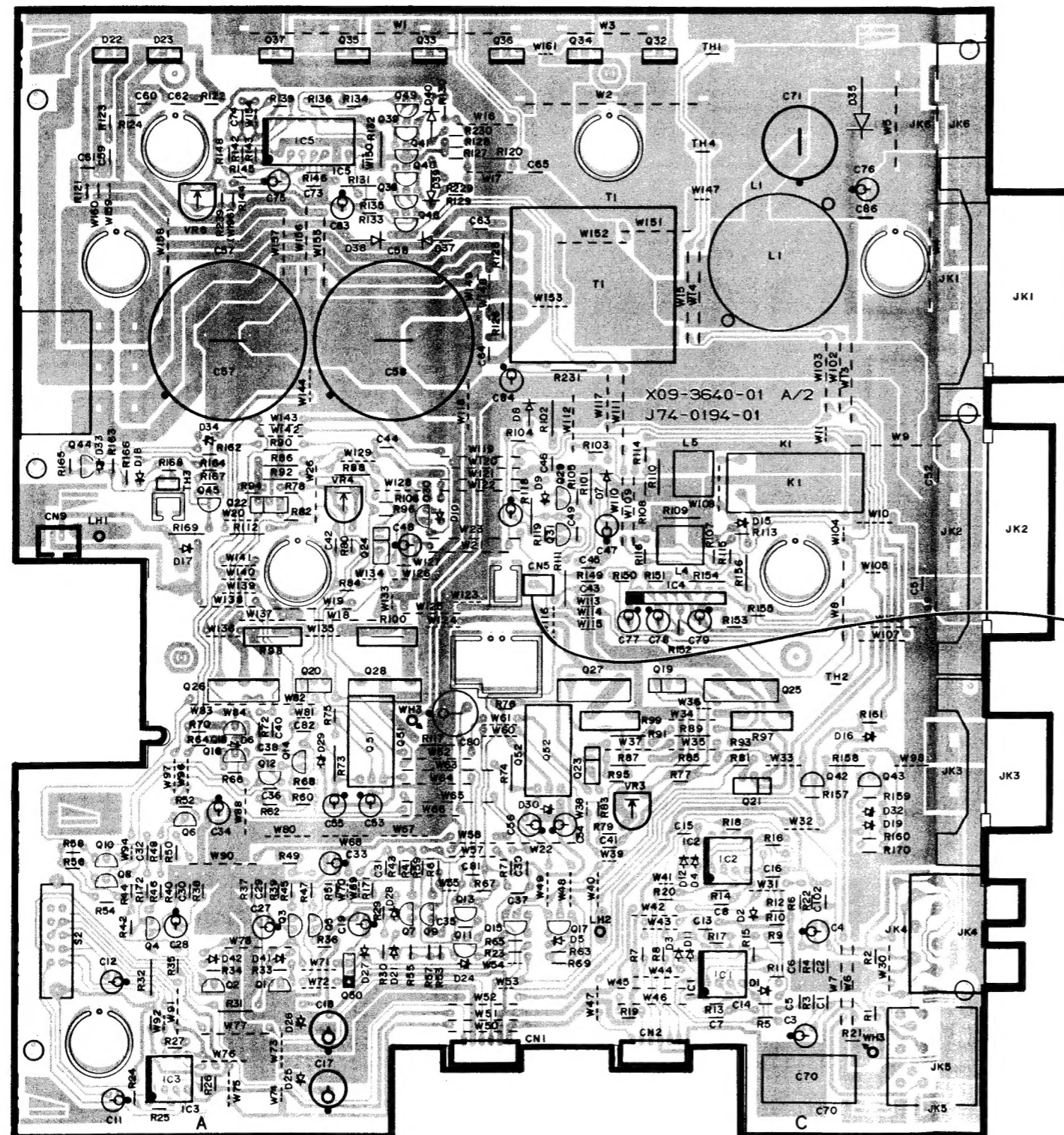
No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	CASSETTE RECEIVER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
Connect a cassette receiver.							
1	BEAT CANCELLER	—	—	Receive AM BROADCAST STATION	VR6	Only when there is BEAT NOISY SOUND. Adjust to minimal position.	
2	IDLE CURRENT	—	Connect a DC voltmeter to CN5	VOLUME: 0	VR3 (L) VR4 (R)	Adjust to 2mV after surely heat up the product.	(a)
* 3	VOLTAGE for OUTPUT of DC-DC converter	—	Connect a DC voltmeter to CN6	VOLUME: 0	VR5	Adjust to 32V when no-signal and S1 is positino of 4Ω.	(b)

\* 3 : This adjustment is for only X09-3640-10 (for North America and Another Areas without Europe).  
X09-3640-01 (for Europe) dose not need this adjustment \*3.

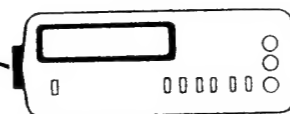
(Note) The DC power shall have a large capacity (of 10 A or more). If it is smaller, the DC-DC converter may not operate.

# PC BOARD (Component side view)

X09-3640-01 A/2

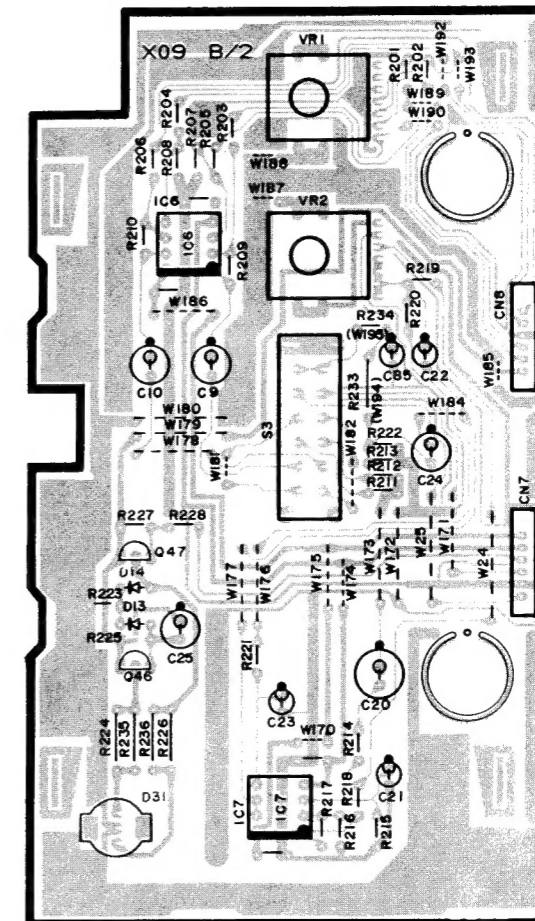


(a) IDLE  
CURRENT  
2mV



DC Voltmeter

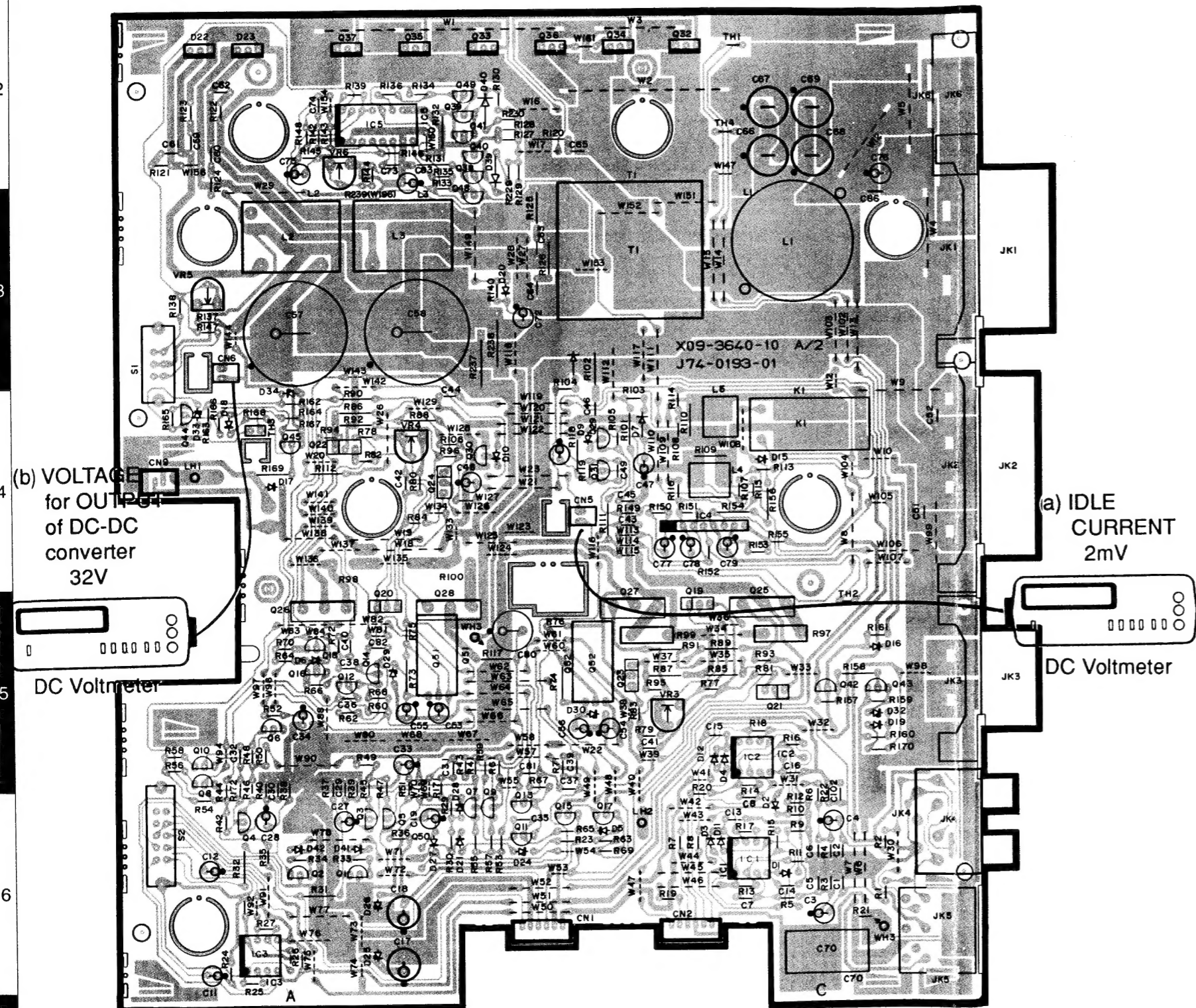
X09-3640-01 B/2



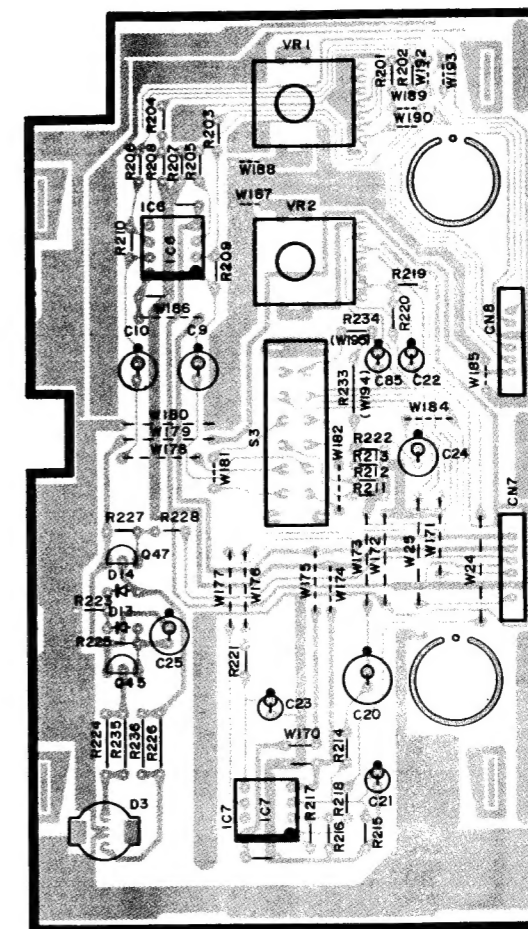
Refer to the schematic diagram for the values of registers and capacitors.

# PB BOARD (Component side view)

X09-3640-10 A/2

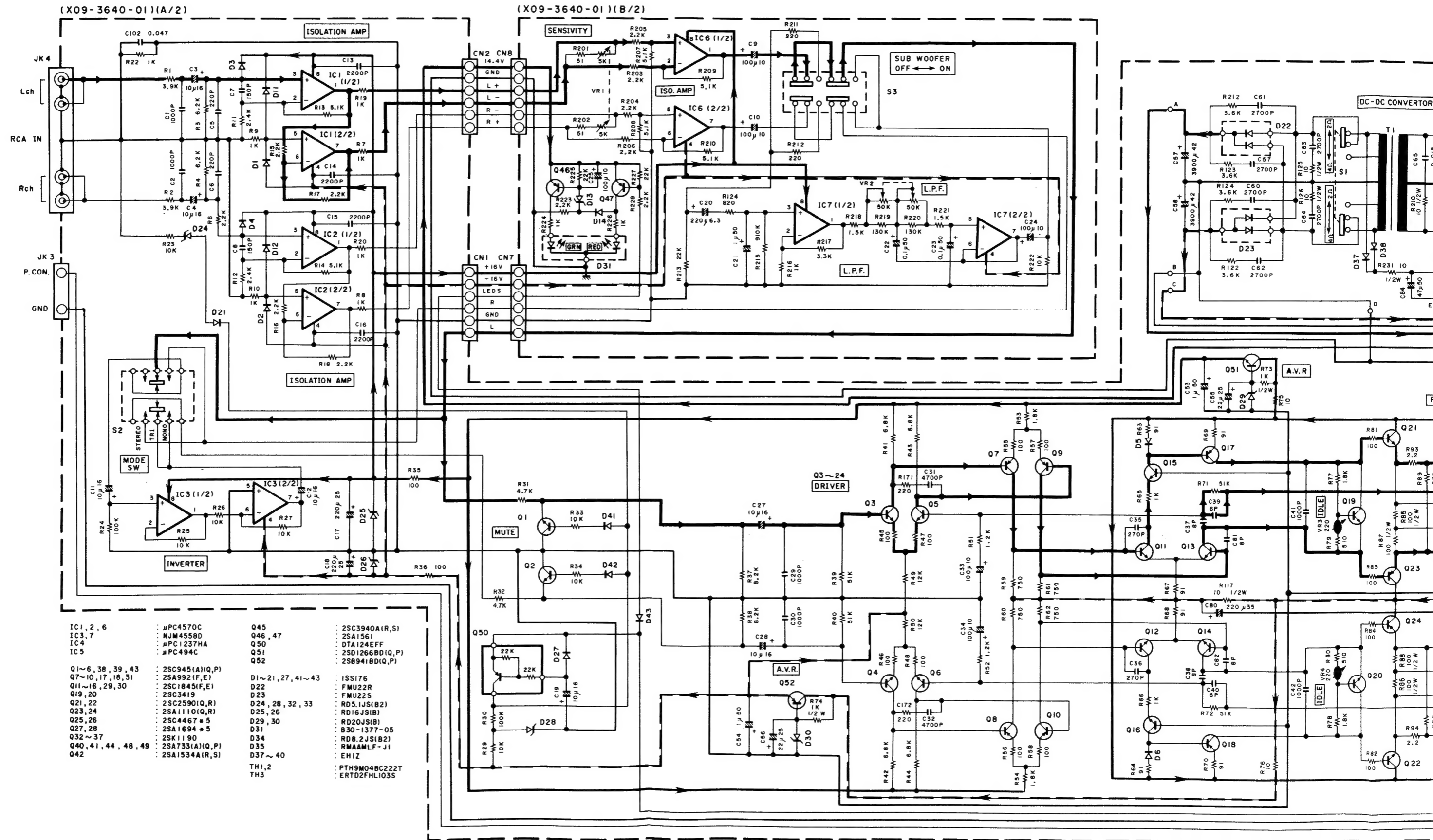


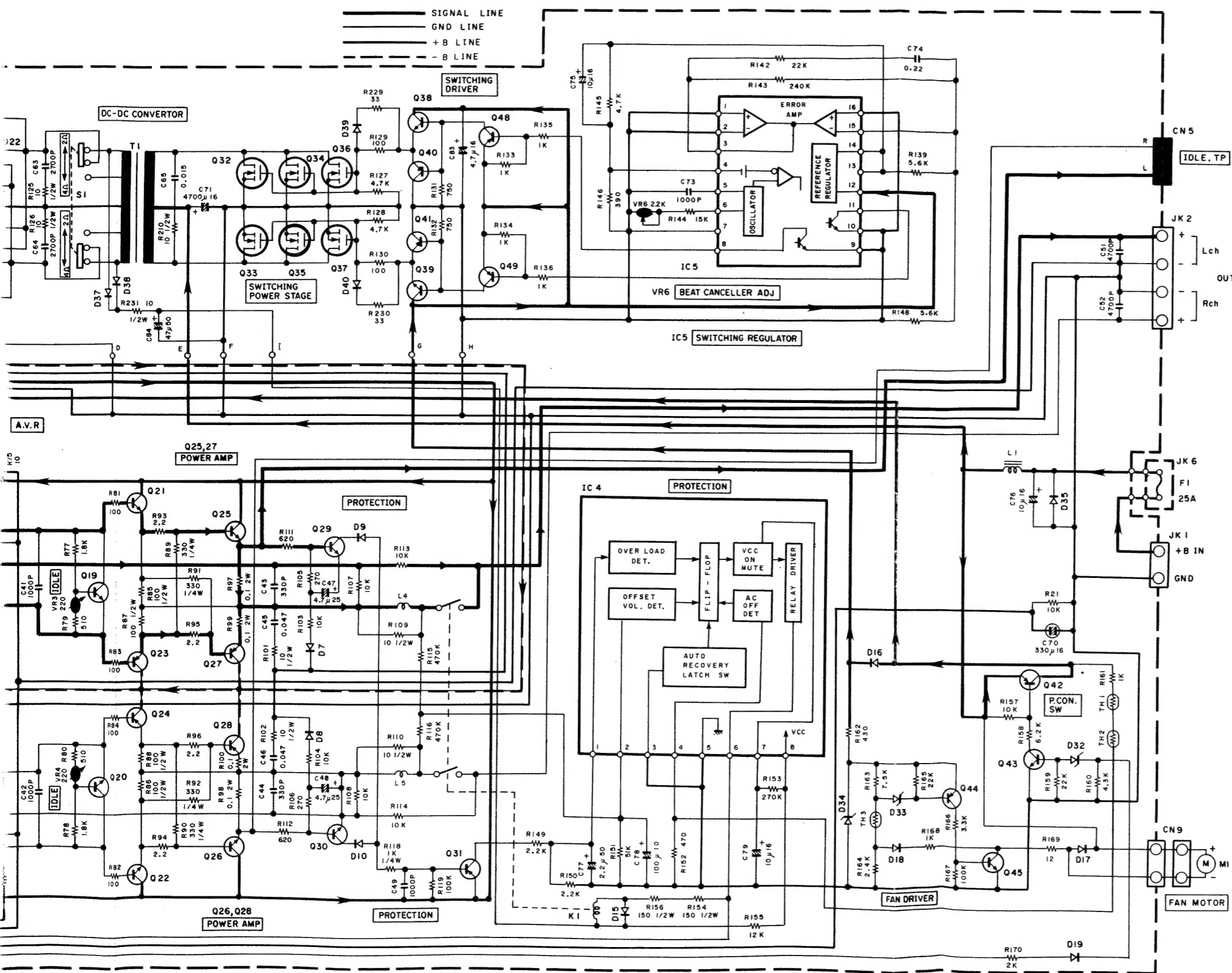
X09-3640-10 B/2



Refer to the schematic diagram for the values of registers and capacitors.

Before begin to repair, please confirm PC Board's Number in product expressing "X09-3640-01".  
If number has expressing "X09-3640-10", look at a next page. The circuit diagram for "X09-3640-10" is shown.





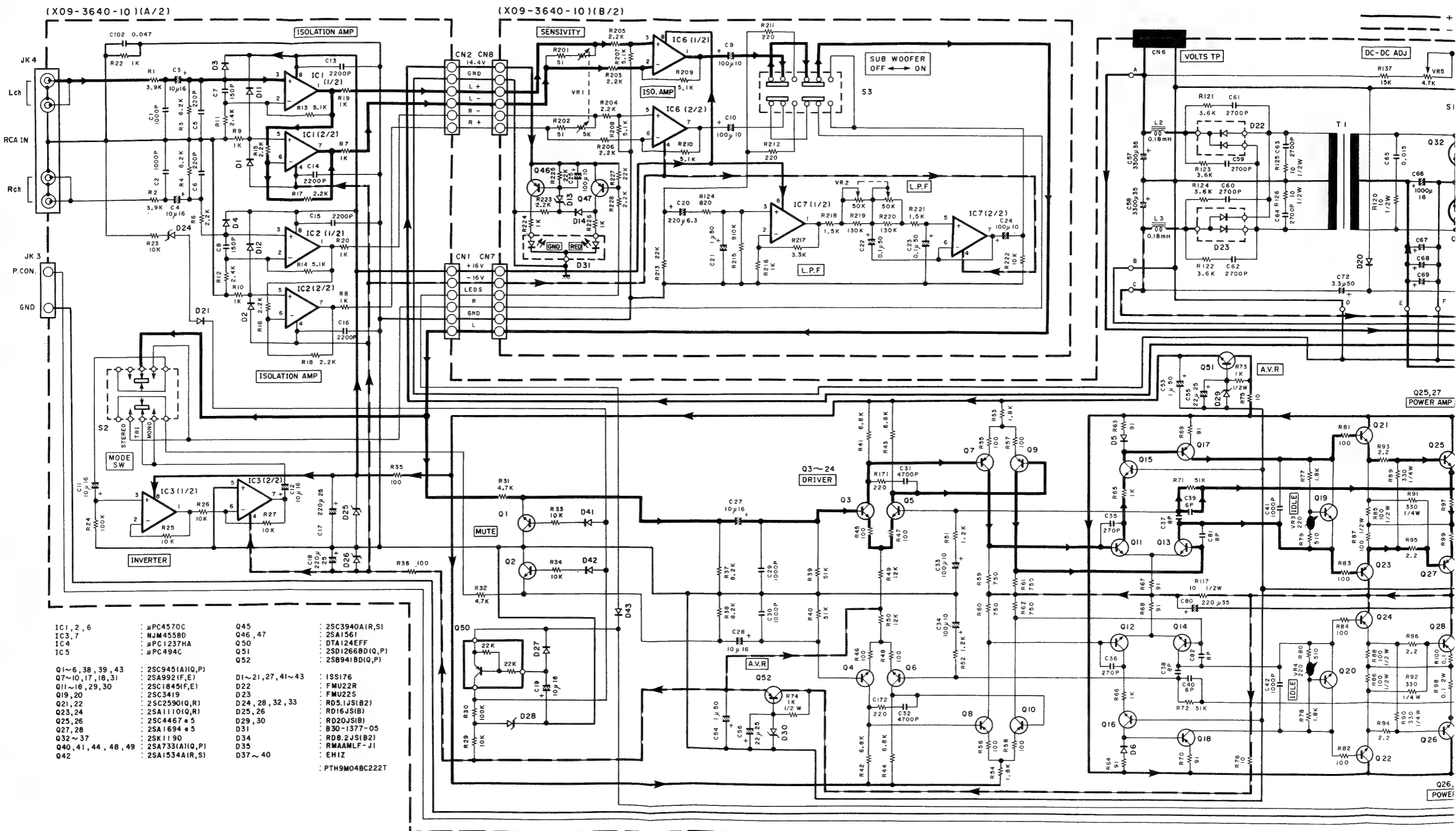
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

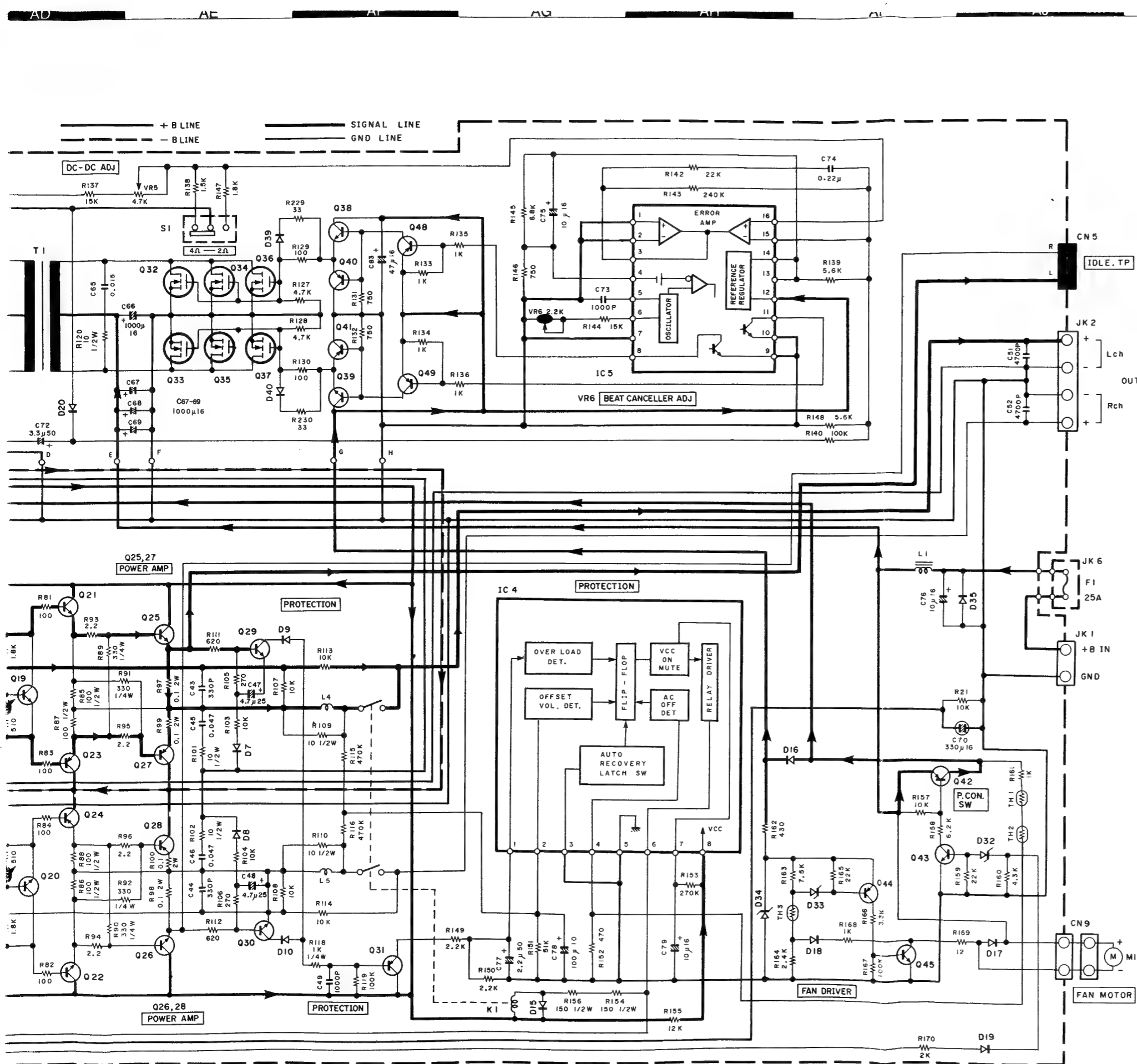
**CAUTION:** For continued safety, replace safety critical components only with manufacture's recommended parts (refer to parts list).  $\Delta$  Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

Y-08-4650-10

**KAC-823**  
**KENWOOD**

Before begin to repair, please confirm PC Board's Number in product expressing "X09-3640-10".  
If number has expressing "X09-3640-01", look at a page before. The circuit diagram for "X09-3640-01" is shown.





- 2SA1534  
2S773(A)  
2SA992  
2SC1845  
2SC3940A  
2SC945(A)
- 2SA1110  
2SC2590
- 2SB941BD
- 2SA1694\*5  
2SC4467\*5
- DTA124EFF
- 2SC3419
- 2SD1266BD
- NJM4558D
- UPC494C
- UPC4570C
- UPC1237HA

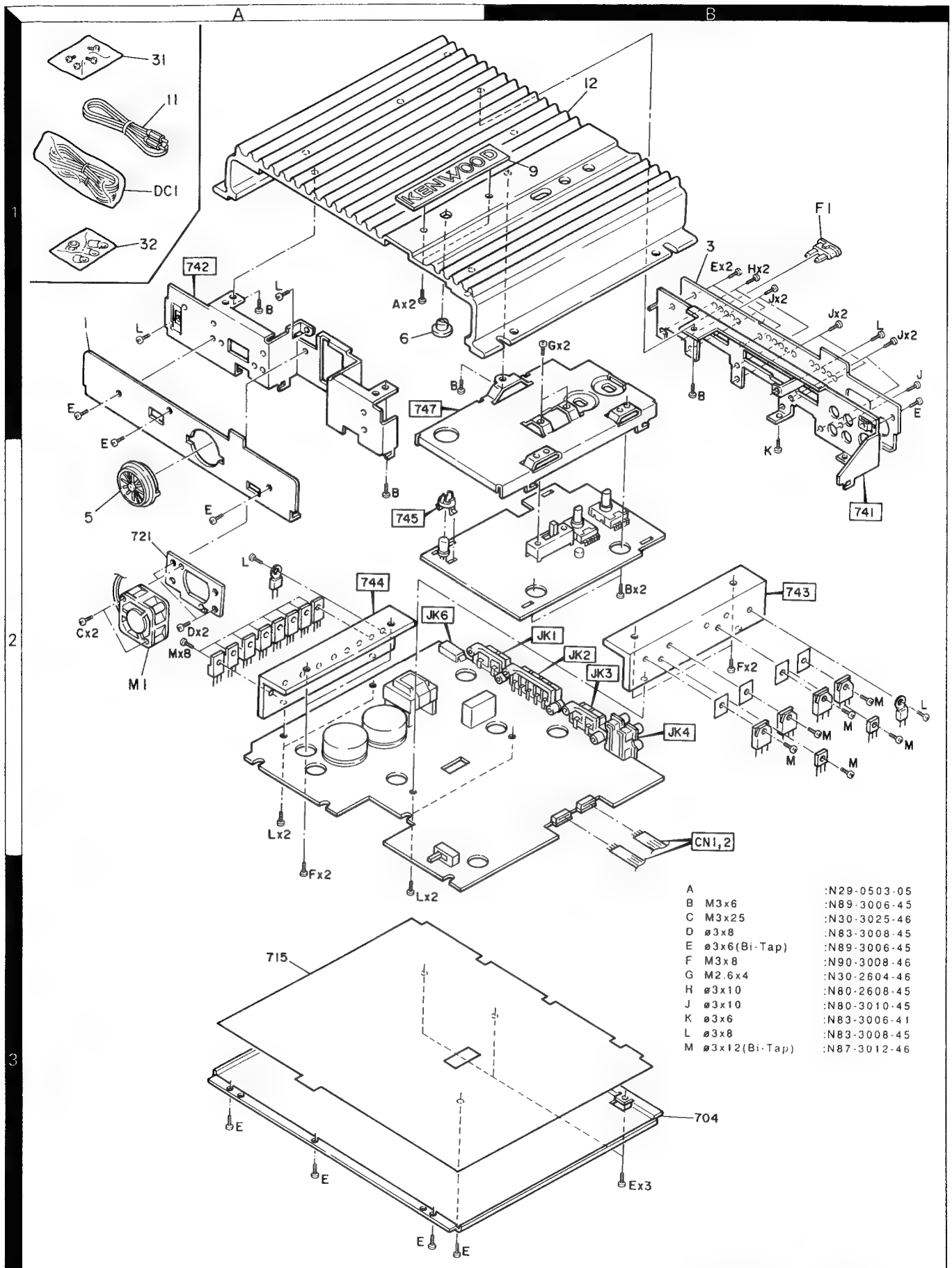
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

**CAUTION:** For continued safety, replace safety critical components only with manufacture's recommended parts (refer to parts list).  $\Delta$  Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

Y-08-4650-10

**KAC-823**  
**KENWOOD**

## EXPLODED VIEW



## PARTS LIST

\* New Parts

Parts without Parts No. are not supplied.

Les articles ne mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
<b>KAC-823</b>						
1	1A	*	A20-7822-13	PANEL ASSY	KM	
1	1A	*	A20-7823-03	PANEL ASSY	E	
3	1B	*	A23-5055-03	REAR PANEL		
5	2A		B07-2028-14	ESCUTCHEON		
6	1A	*	B19-0907-14	LIGHTING BOARD		
9	1B		B43-1205-14	KENWOOD BADGE		
-			B46-0100-20	WARRANTY CARD		
-			B58-1210-04	CAUTION CARD		
-		*	B59-0707-00	SUB-INSTRUCTION MANUAL	M	
-		*	B64-0187-00	INSTRUCTION MANUAL	KM	
-		*	B64-0188-00	INSTRUCTION MANUAL	E	
11	1A	*	E30-3999-05	AUDIO CORD	M	
△ DC1	1A	*	E30-3804-05	DC CORD ASSY (critical comp.)	EM	
12	1B	*	F01-1400-11	HEAT SINK		
F1	1B		F05-2531-05	FUSE (25A フレート"カ"タ)		
M1	2A		F09-1208-05	FAN		
-		*	H01-9422-04	ITEM CARTON CASE	KM	
-		*	H01-9430-04	ITEM CARTON CASE	E	
-		*	H03-3493-04	OUTER CARTON CASE		
-		*	H10-4416-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0321-04	PROTECTION BAG (600X315X0.03)		
-			H25-0336-04	PROTECTION BAG (170X250X0.03)		
31	1A		N99-1577-15	SCREW SET		
A	2A		N29-0503-05	RETAINING RING (37mm)		
B	1A, 2A		N89-3006-45	PAN HEAD MACHIN SCREW		
C	2A		N30-3025-46	PAN HEAD MACHIN SCREW		
D	2A		N83-3008-45	PAN HEAD TAPTITE SCREW		
E	3A, 3B		N89-3006-45	BINDING HEAD TAPTITE SCREW		
F	2A, 2B		N90-3008-46	PAN HEAD MACHIN SCREW		
32	1A	*	W01-0720-05	ACCESSORY	EM	
<b>AUDIO UNIT (X09-3640-10:K.M / -01:E)</b>						
D31		*	B30-1377-05	LED		
C1 ,2			CK45FB1H102K	CERAMIC 1000PF K		
C3 ,4			CE04DW1C100M	ELECTRO 10UF 16WV		
C5 ,6			CC45FSL1H221J	CERAMIC 220PF J		
C7 ,8			CC45SL1H151J	CERAMIC 150PF J		
C9 ,10			CE04CW1A101M	ELECTRO 100UF 10WV		
C11 ,12			CE04DW1C100M	ELECTRO 10UF 16WV		
C13 ,16			CK45FB1H222K	CERAMIC 2200PF K		
C17 ,18			CE04DW1E221M	ELECTRO 220UF 25WV		
C19			CE04DW1C100M	ELECTRO 10UF 16WV		
C20			CE04CW0J221M	ELECTRO 220UF 6.3WV		
C21			C90-2608-05	ELECTRO 1.0UF 50WV		
C22			C90-2604-05	ELECTRO 0.22UF 50WV		
C23			C90-2602-05	ELECTRO 0.1UF 50WV		
C24 ,25			CE04CW1A101M	ELECTRO 100UF 10WV		
C27 ,28			CE04DW1C100M	ELECTRO 10UF 16WV		
C29 ,30			CF92FV1H102J	MF 1000PF J		
C31 ,32			CF92FV1H472J	MF 4700PF J		

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C33 ,34 C35 ,36 C37 ,38 C39 ,40 C41 ,42			CE04DW1A101M CC45FSL1H271J CC45FSL1H080D CC45FSL1H060D CF92FV1H102J	ELECTRO 100UF 10WV CERAMIC 270PF J CERAMIC 8.0PF D CERAMIC 6.0PF D MF 1000PF J		
C43 ,44 C45 ,46 C47 ,48 C49 C51 ,52			CC45FSL1H331J CF92FV1H473J CE04DW1E4R7M CK45FB1H102K CF92FV1H472J	CERAMIC 330PF J MF 0.047UF J ELECTRO 4.7UF 25WV CERAMIC 1000PF K MF 4700PF J		
C53 ,54 C55 ,56 C57 ,58 C57 ,58 C59 -64			CE04DW1H010M CE04DW1E220M C90-1616-05 C90-1617-05 CF92FV1H272J	ELECTRO 1.0UF 50WV ELECTRO 22UF 25WV ELECTRO 3300UF 35WV ELECTRO 3900UF 42WV MF 2700PF J	KM E	
C65 C66 -69 C70 C71 C72			CF92V1H153J C90-2660-05 C90-2576-05 C90-2690-05 CE04DW1H3R3M	MF 0.015UF J ELECTRO 1000UF 16WV NP-ELECT 330UF 16WV ELECTRO 4700UF 16WV ELECTRO 3.3UF 50WV	KM E KM	
C73 C74 C75 ,76 C77 C78		*	CF92FV1H102J C91-2056-05 CE04DW1C100M CE04DW1H2R2M CE04DW1A101M	MF 1000PF J MF 0.22UF J ELECTRO 10UF 16WV ELECTRO 2.2UF 50WV ELECTRO 100UF 10WV		
C79 C80 C81 ,82 C83 C84			CE04DW1C100M CE04DW1V221M CC45FSL1H080D CE04DW1C470M C90-2724-05	ELECTRO 10UF 16WV ELECTRO 220UF 35WV CERAMIC 8.0PF D ELECTRO 47UF 16WV ELECTRO 47UF 50WV	E	
C102			CF92FV1H473J	MF 0.047UF J		
CN1 ,2 JK1 JK2 JK3 JK4	2B 2B 2B 2B 2B		E40-9129-05 E70-0804-05 E20-0479-05 E20-0239-05 E13-1401-05	FLAT CABLE CONNECTOR TERMINAL BOARD (B.UP/GND) TERMINAL BOARD (L/R OUT ,4P) TERMINAL BOARD (P.CON/GND ,2P) PHONE JACK (L/R IN)		
△ JK6 LH1 ,2	2A	*	J13-0601-05 J19-2826-05	FUSE HOLDER (critical comp.) HOLDER		
L1 L2 ,3 L4 ,5 T1 T1		*	L33-0991-05 L33-0990-05 L39-0085-05 L19-0523-05 L19-0524-05	CHOKE COIL CHOKE COIL PHASE-COMPENSATION COIL TRANSFORMER FOR CONVERTER TRANSFORMER FOR CONVERTER	KM KM E	
G H J K L	1B 1B 1B 1B 1A, 2A		N30-2604-46 N80-2608-45 N80-3010-45 N83-3006-41 N83-3008-45	PAN HEAD MACHIN SCREW PAN HEAD TAPTITE SCREW PAN HEAD TAPTITE SCREW PAN HEAD TAPTITE SCREW PAN HEAD TAPTITE SCREW		
M	2A, 2B		N87-3012-46	BRAZIER HEAD TAPTITE SCREW		
R7 ,8 R13 ,14 R15 -18 R19 ,20			R92-2101-05 R92-2103-05 R92-2102-05 R92-2101-05	METAL FILM 1K D 1/6W METAL FILM 5.1K D 1/6W METAL FILM 2.2K D 1/6W METAL FILM 1K D 1/6W		

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R73 ,74 R85 -88 R97 -100 R101,102 R109,110			RD14DB2H102J RD14DB2H101J R92-0205-05 RD14DB2H100J RD14DB2H100J	SMALL-RD 1.0K J 1/2W SMALL-RD 100 J 1/2W METAL-PLATE 0.1 K 2W SMALL-RD 10 J 1/2W SMALL-RD 10 J 1/2W		
R117 R120 R125,126 R154 R156			RD14DB2H100J RD14DB2H100J RD14DB2H100J RD14DB2H151J RD14DB2H151J	SMALL-RD 10 J 1/2W SMALL-RD 10 J 1/2W SMALL-RD 10 J 1/2W SMALL-RD 150 J 1/2W SMALL-RD 150 J 1/2W		
R203-206 R207-210 R231 VR1 VR2			R92-2102-05 R92-2103-05 RD14DB2H100J R10-2622-05 R10-4645-05	METAL FILM 2.2K D 1/6W METAL FILM 5.1K D 1/6W SMALL-RD 10 J 1/2W POTENTIOMETER(5K) POTENTIOMETER(50K)	E	
VR3 ,4 VR5 VR6			R12-0092-05 R12-1069-05 R12-1067-05	TRIMMING POT.(220 ㄱ) TRIMMING POT.(4.7K ㄱ) TRIMMING POT.(2.2K)	KM	
K1 S1 S1 S2 S3		*	S76-0804-05 S31-2130-05 S62-0815-05 S62-0814-05 S62-0810-05	MAGNETIC RELAY SLIDE SWITCH SLIDE SWITCH SLIDE SWITCH SLIDE SWITCH	KM E	
D1 -19 D1 -21 D21 D22 D23		*	1SS176 1SS176 1SS176 FMU22R FMU22S	DIODE DIODE DIODE DIODE DIODE	E KM E	
D24 D25 ,26 D27 D28 D29 ,30			RD5.1JS(B2) RD16JS(B) 1SS176 RD5.1JS(B2) RD20JS(B)	ZENER DIODE ZENER DIODE DIODE ZENER DIODE ZENER DIODE		
D32 ,33 D34 D35 D37 -40 D39 ,40			RD5.1JS(B2) RD8.2JS(B2) RM4AMLF-J1 EH1Z EH1Z	ZENER DIODE ZENER DIODE DIODE DIODE DIODE	E KM	
D41 -43 IC1 ,2 IC3 IC4 IC5			1SS176 UPC4570C NJM4558D UPC1237HA UPC494C	DIODE IC(OP AMP X2) IC(OP AMP X2) IC(POWER AMP) IC(SWITCHING REGULATOR)		
IC6 IC7 Q1 -6 Q7 -10 Q11 -16			UPC4570C NJM4558D 2SC945(A)(Q,P) 2SA992(F,E) 2SC1845(F,E)	IC(OP AMP X2) IC(OP AMP X2) TRANSISTOR TRANSISTOR TRANSISTOR		
Q17 ,18 Q19 ,20 Q21 ,22 Q23 ,24 Q25 ,26			2SA992(F,E) 2SC3419 2SC2590(Q,R) 2SA1110(Q,R) 2SC4467*5	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q27 ,28			2SA1694*5	TRANSISTOR		

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Q29 ,30			2SC1845(F,E)	TRANSISTOR		
Q31			2SA992(F,E)	TRANSISTOR		
Q32 -37			2SK1190	FET		
Q38 ,39			2SC945(A)(Q,P)	TRANSISTOR		
Q40 ,41			2SA733(A)(Q,P)	TRANSISTOR		
Q42			2SA1534A(R,S)	TRANSISTOR		
Q43			2SC945(A)(Q,P)	TRANSISTOR		
Q44			2SA733(A)(Q,P)	TRANSISTOR		
Q45			2SC3940A(R,S)	TRANSISTOR		
Q46 ,47			2SA1561	TRANSISTOR		
Q48 ,49			2SA733(A)(Q,P)	TRANSISTOR		
Q50			DTA124EFF	DIGITAL TRANSISTOR		
Q51			2SD1266BD(Q,P)	TRANSISTOR		
Q52			2SB941BD(Q,P)	TRANSISTOR		
TH1 ,2		*	PTH9M04BC222T	POSITIVE RESISTOR		
TH3			ERTD2FHL103S	THERMISTOR		

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# KAC-823

## [Audio Section]

Max Power Output (4 ohm) Normal .....	150 W + 150 W
Bridged .....	360 W
Rated Power Output (4 ohm)	
Normal (20 Hz~20 kHz, less than 0.05% THD) .....	70 W + 70 W
Bridged (1 kHz, less than 0.3% THD) .....	170 W
Rated Power Output (2 ohm)	
Normal (1 kHz, less than 0.3% THD) .....	85 W + 85 W
Frequency Response (-3 dB) .....	2 Hz ~ 45 kHz
Sensitivity (rated output) MAX .....	0.15 V
MIN .....	3.0 V
Signal to Noise Ration .....	105 dB
Input Impedance .....	10 k $\Omega$
Damping Factor (100 Hz) .....	More than 200
Low Pass Filter Frequency .....	30 ~ 200 Hz (VARIABLE)

## [General]

Operating Voltage.....	14.4 V (11~16 V allowable)
Current Consumption (MAX.) .....	25 A
Dimensions (W x H x D) .....	273 x 56 x 220 mm
	(10 x 3/4 x 2-3/16 x 8-11/16 in.)
Weight .....	3.7 kg. (8.2 lb)